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Impact of Mercuric Nitrate on the Oxygen Consumption of Fresh Water Crab. *Barytelphusa guerini*

S.S. Jadhav[1], V.D. Shinde[2*], D. Sirsat[3], B.P. Katore[4], N.E. Ambore[5]

[1]*Dept. of Zoology, Amolak Science College, Kada. (M.S.)*
[2]*Toshniwal A.C.S. College, Sengaon (M.S.)*
[3]*Late. S.Gutte College, Dharmapuri (M.S.)*
[4]*Nagnath ACS College Aundha Nagnath (M.S.)*
[5]*Ex Head, Dept. of Zoology, Yashwant Mahavidyalaya, Nanded. (M.S.)*

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*Corresponding Author

Tel : +91-9423105959
Fax : +91-9423105959

Email: vikasshinde_1473@rediffmail.com

Abstract

The rate of Oxygen consumption of the crab, *Barytelphusa guerini* is increased initially when exposed to lethal concentration of mercuric nitrate,However lethal concentration decreased their metabolic rate.

Key Words: Mercuric nitrate, Oxygen Consumption rate and *Barytelphusa guerini*

Introduction

Oxygen consumption of aquatic animals is a very sensitive physiological process and therefore, alteration in the respiratory activity is considered as an indicator of stress of animals exposed to heavy metals. Discharge of heavy metals into aquatic environment have created severe health hazard in aquatic organism including man. Although their normal level are not dangerous to aquatic life and are known to be essential to sustain life activities, recent increases in aquatic agricultural development and industrialization has been considered as the main source of metals in aquatic ecosystem. Studies on the oxygen consumption rate of different of crab exposed to different pollutants.[12, 9, 8, 7]

Hence the present investigation was undertaken to study the respiratory metabolism of the fresh water crab, Barytelphusa guerini exposed to mercuric nitrate for varying periods.

Material and Methods

The fresh water crab, *Barytelphusa guerini* was selected for experimentation. It is abundantly available in the paddy fields of Nanded district. The animals were collected and brought to the laboratory to acclimatize them with laboratory conditions. Only healthy crabs were selected for the experimentation to avoid the effect of sex and size [1]. The fresh water crab *Barytelphusa guerini* were subjected to lethal concentration of 0.60 ppm of mercuric nitrate. The crab weighing 35 to 50 gms were used for experimentation. The amount of dissolved oxygen in the sample was determined by the standard Winkler's method as given by [11]. The total oxygen consumption was calculated.

Result and Discussion

Total oxygen consumption expressed in terms of cc of O2 / animal / hr. is the average of 6 observation ± S.D.

Table. Impact of mercuric nitrate on total oxygen consumption in fresh water crab, Barytelphusa guerini.

Sr.No.	Duration of exposure in hrs.	Total oxygen consumption in cc of O_2/animal/hr
1	Control	2.435 ± 0.42
2	24	1.779 ± 0.38
3	48	1.592 ± 0.21
4	72	1.076 ± 0.15
5	96	1.346 ± 0.325

The rate of total consumption of fresh water crab, *Barytelphusa guerini* has been studied with the treatment of mercuric nitrate upto 96 hrs. Mercuric nitrate exposed animals. Exhibits decreasing trends of oxygen consumption up to 96 hrs. when compared with control group of animals.

Respiration is an essential physiological activity of all living organisms. Oxygen is necessary to provide energy for living processes for carrying out all other metabolic activities. The changes in rate of oxygen consumption is a good index of the metabolic capacity of an organism to face environment stress. It is evident from the result that the metallic pollutants exert its influence affecting oxygen consumption. The alteration in the normal respiratory metabolism is due to its intimate contact with polluted water which decreases the oxygen diffusing capacity of the gills. [3, 6, 7, 5] Jones *et al.,* [4] also reported decline of oxygen consumption in fish, Gasterosteus aculeatus when exposed to mercury chloride, copper sulphate and lead nitrate solution. Usharani *et al.,* [10] have reported decreases in oxygen consumption in the fresh water teleost *Tilapia mossambica* on exposure to cadmium. Dutt *et al.,* [2] have reported mercuric chloride and methyl mercuric chloride have lowered oxygen consumption in cat fish, *Mystus vittatus*. The changes in rate of oxygen consumption of fresh water crab, *Barytelphus guerini* exposure to lead nitrate shows decrease in oxygen consumption and it is evident. Earlier obtained results of the workers in a different animal on exposure the different pollutants which exhibit enhancement of decreases in oxygen consumption of exposed animals.

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